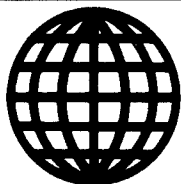


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28 NOVEMBER 1988



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JPRS Report

Nuclear Developments

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Nuclear Developments

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Cutback in Nuclear Power Plan Urged
OW0611141988 Beijing XINHUA in English
0843 GMT 6 Nov 88

[Text] Beijing, November 6 (XINHUA)—China is to reduce its planned expansion of nuclear power by 40 percent, today's CHINA DAILY BUSINESS WEEKLY reported.

China had planned to build nuclear plants to boost output by 10,000 megawatts by the year 2000, but experts at a recent meeting suggested this be revised to 6,000 megawatts.

Delegates from provincial planning departments also argued that even this might be too expensive and demanded that the target be only 4,500 megawatts by the turn of the century, the paper reported.

This figure would include the 1,800-megawatt plant at Daya Bay, Guangdong Province; the 300-megawatt plant at Qinshan, Zhejiang Province; and four 600-megawatt reactors to be added to Qinshan's second and third phases.

Power shortage has been a headache for the country for many years. Between 1981 and 1987, the annual increase in power output fell far behind the 11-percent industrial growth, the paper said.

Over the past few years, Chinese experts realized that they overestimated the nation's resources in terms of cash and manufacturing technology.

Zang Mingchang, chief engineer of nuclear industry in the Ministry of Energy Resources, said the experts at the meeting had sought to take a more realistic approach, according to the paper.

He said China's electricity-generating capacity is expected to increase to 240,000 megawatts by the year 2000, from 101,920 megawatts in 1987. But this will still fall short of demand.

By the turn of the century the capacity of thermal power plants in China will account for 68 percent of the total energy structure—hydroelectric 30 percent and nuclear power 2 percent.

Experts forecast that China will need at least 280,000 megawatts, or 320,000 megawatts in capacity, to completely meet demand.

Nuclear Physics Conference Notes Research Strides

HK0811131588 Beijing CEI Database in English
8 Nov 88

[Text] Nanjing (CEI)—China has made remarkable progress in nuclear physics research is undertaking projects of advanced nuclear research, according to the Seventh National Nuclear Physics Conference held in Nanjing in mid-October.

In this field, China's achievement covers data acquiring, basic theoretic study, and the development of sophisticated instruments and equipment.

For example, in the study of nuclear collective movement, Beijing and Qinghua Universities have acquired systematic fruitful results that have gained them the recognition of their international counterparts.

In the research of Mossbauer spectroscopy, Nanjing University was listed in third place in the world, following the Federal Republic of Germany and the United States.

Yang Liming, director of China's Nuclear Physics Association, said that China has built three accelerators in the sectors of high energy, medium energy, and low energy.

The electron-positron collider built by the Institute of High Energy Physics of China's Academy of Sciences has succeeded in coming into operation.

Construction of the main parts of the "heavy ion accelerator" has been completed at the Research Institute of Modern Physics of the Chinese Academy of Sciences, and their quality is of the most advanced by the world standard.

"Series electrostatic accelerator" have been built and put into operation in China's Academy of Nuclear Energy Science.

ARGENTINA

CNEA Signs Agreement With Soviet Company

PY2810183188 Buenos Aires TELAM in Spanish
1650 GMT 27 Oct 88

[Text] Buenos Aires, 27 Oct (TELAM)—The CNEA today signed an agreement with the Soviet company Teckmasheksport to enrich a shipment of Argentine uranium to a concentration of 20 percent.

As soon as this uranium is sent back to Argentina, it will be used to produce fuel for the R.A.3 radioisotope-producing reactor of the Ezeiza nuclear plant.

The CNEA has issued a communique stating that this agreement is part of the Argentine-Soviet cooperation for the peaceful use of nuclear energy.

The communique says that the enrichment service was requested in view of the delay in completing the construction of the Pilcaniyeu uranium enrichment plant.

This delay has been caused by the lack of funds allocated for the construction of the plant because of the strict budget restrictions that have been adopted in view of the financial-economic situation of the country.

The communique concludes by saying that, because of the delay, the production of uranium is still insufficient to meet the domestic demand and to comply with the contracts signed with foreign countries.

BRAZIL

CNEN Head on World Nuclear Market Participation

PY2810024788 Brasilia Domestic Service
in Portuguese 2100 GMT 27 Oct 88

[Text] This morning Rex Nazare, president of the CNEN [National Commission for Nuclear Energy], informed the Congress budget commission about the CNEN budget.

[Begin Nazare recording] About 25 billion cruzados will be allotted to the continuation of the [word indistinct] of approximately 200 national companies that, together with the CNEN, participate in an autonomous development project that creates jobs and national products.

The other 40 billion will be used in the exploitation of the fifth largest uranium deposit in the world, and to make possible our participation in the international nuclear market, which moves \$11 billion annually. This participation cannot be denied to us, even though it has been denied to us. [end recording]

Rex Nazare said that some developed countries do not want Brazil to develop its nuclear capability.

INB Agreement To Promote Uranium Exports

51002034b Sao Paulo O ESTADO DE SAO PAULO
in Portuguese 28 Oct 88 p 27

[Text] Brasilia—Brazil's participation in the international uranium concentrate market is part of an agreement about to be concluded between Nuclear Industries of Brazil (INB) and private enterprise firms, including Paranapanema, MBR, Inc, and the Norberto Odebrecht, Mendes Junior, and Andrade Gutierrez construction companies. The agreement is due to be completed this year, and the stockholders' participation has been determined: The government will hold 51 percent of the stock shares, while private enterprise will retain 49 percent.

To achieve success in these negotiations, a company has already been registered with the Caldas Commercial Board, in Minas Gerais; and the board of directors of Uranium, Inc, took office on Wednesday night, with Jose Nilton Sampaio as chairman. Brazil has geological uranium reserves calculated at 301,400 metric tons, and the world market allows annual business involving up to \$65 million, "a potential that cannot be underestimated," stresses INB's president, John Milne Albuquerque Forman.

According to Forman and data recently obtained by the London Uranium Institute, starting in 1990 there will be an annual uranium demand exceeding 12,000 tons. But the forecast is for an unmet demand of more than 52,000 tons by the year 2000. In the negotiations between INB and the private companies, the latter will be responsible for uranium extraction, while the government will be involved in technology and distribution of geological resources, including gold, among the firms. For example, this is the case for whoever procures the Gandarela region in Minas Gerais, southeast of Belo Horizonte, a municipality of Rio Acima, where uranium is in conjunction with other mineral assets.

Deposits

There is a total of eight deposits/mines: Pocos de Caldas Plateau (Minas Gerais); Lago Real Uranium Producing Province (Bahia); Itataia Uranium Producing Province (Ceara); Iron Producing Quadrangle (Minas Gerais); Figueira (Parana); Amorinopolis (Goiias); Rio Preto Uranium Producing Province (Goiias); and Espinhares (Paraiba). The Pocos de Caldas deposit has been in production since 1982. It has an industrial complex, currently the only source producing uranium concentrate.

IMF, World Bank Charged With Holding Back Loans

PY0111130488 Sao Paulo O ESTADO DE SAO PAULO in Portuguese 28 Oct 88 p 27

[Text] Brasilia—Yesterday in Brasilia, Rex Nazare, chairman of the National Commission for Nuclear Energy (CNEN), said that the IBRD [World Bank] and

the IMF are exerting pressure on the Brazilian Government to open the so-called parallel nuclear program to international inspection. According to reports made to ESTADO Press Agency by government economic team sources, these pressures are delaying the granting of \$500 million to be used in financing the electrical sector recovery plan, monies already agreed upon by Brazil and the IBRD. The granting of this IBRD loan is an indispensable condition for the granting of a \$450 million loan already agreed upon with the Japanese Government.

After giving a lecture to the Congressional Budget Committee, Rex Nazare asserted that he will leave the CNEN chairmanship if the Brazilian Government gives in to this international pressure. The "parallel nuclear program," now part of the Brazilian Nuclear Program, developed independently from an agreement signed with the FRG in 1977 and is not subject to international supervision.

The Institute for Nuclear Energy Research (IPEN) in Sao Paulo; the Institute of Nuclear Energy (IEN) in Rio de Janeiro; and the Radio Protection and Dosimetry Institute, also in Rio de Janeiro, are part of the Brazilian Nuclear Program. The program's projects include the enrichment of uranium, the development of the metal-work sector, research on nuclear propulsion, and the radiation of foodstuff and surgical instruments.

All these units will soon be absorbed by the recently created Brazil Nuclear Industries (INB), a holding [preceding word in English] that will also absorb Brazil Uranium S.A., which is responsible for uranium prospecting projects along with private-sector companies. Nuclebras Heavy Equipment Co. (Nuclep), which can manufacture large reactors, will soon be privatized by the government.

According to Nazare, "the attempt to prevent the technological development of the developing countries, which previously consisted of creating difficulties for the transference of technology, goods, and services, now consists of creating difficulties in the economic and financial fields." The recent restrictions imposed by the international financial organizations on loans granted to Brazil confirm this situation, Nazare said. "The financial organizations are trying to handle the national projects and to decide about the future of the country from abroad, in direct violation of our right to self-determination," he said. During the lecture, the CNEN chairman commented on all the efforts made—first by the United States and then by the other nuclear superpowers—to limit the number of countries with access to nuclear technology.

Nazare's Charges of Bank Withholding Loans Scored

51002034a Sao Paulo O ESTADO DE SAO PAULO
in Portuguese 30 Oct 88 p 3

[Unattributed commentary]

[Text] What could have prompted Rex Nazare, chairman of the National Commission for Nuclear Energy [CNEN], to raise his (could it be?) Don Quixote sword to vehemently protest alleged World Bank restrictions on the Brazilian parallel agreement for atomic research? He claims that the bank is postponing the release of a loan of \$500 million to Eletrobras [Brazilian Electric Power Companies, Inc], because it wants Brazil to open its research work for international inspection. "Never," he asserts. And if "the government gives in," he will leave CNEN. This is the serious threat hovering over the nation: Rex Nazare may leave CNEN because Brazil cannot show foreigners that it is trying to manufacture its own atomic bomb!

In short, it is a tragicomedy that could only happen in a country without a government and without a president. Mr Nazare should not leave CNEN spontaneously, but be dismissed for raising, in the name of the country, a problem that does not exist, and for premeditatively harming vital negotiations that were in the final phase, for procuring financing that is absolutely necessary and urgently required for the electric power plant construction program. The CNEN chairman took precise advantage of the time the Brazilian mission is preparing to travel to Washington (now with a new official cost budget for the electric power projects, with a good chance of concluding the financial agreement) to come out with more of that bravado. What is deferring the release of the loans is not the Brazilian parallel program, pursuing goals with which we are all familiar, and which are of no current concern to the nation. If anyone wants to manufacture nuclear submarines or atomic bombs, that is his problem. But money cannot be requested from the World Bank for this purpose. Eletrobras' situation was obviously complicated when, in the hush of evening, the president signed a decree-law transferring to it the mission of building two more nuclear power plants. But only because those projects entailed an unwarranted increase in spending (at least another \$600 million, not counting the generating cost), which would further weaken the economy of a sector that already owes more than \$20 billion, much of it to IBRD. Still, the bank's demands were confined only to the financial area. IBRD wants the government to assume responsibility for the new costs, which could by no means be included in the financing requested, inasmuch as the nuclear power plants simply cannot be paid for.

This had already been settled; the new plan to be submitted to the World Bank is clear about the origin of the money required for the nuclear plants: It will have to come from the Treasury, and not the World Bank. Hence, to conclude that the latter is trying to force Brazil

to give up its parallel program is light-years off the mark. The military atomic program and that of CNEN must necessarily be something totally autonomous, dissociated from external financing, as should any research of that type aimed at self-sufficiency in the weapons field.

Rex Nazare and his technocrats can do what they think best, as they have been doing. What they cannot do is involve Eletrobras and the serious programs for electric power generation and transmission, to the detriment of the country, which definitely cannot provide the IBRD financing at present without a collapse in the electric power supply. The costs of the energy program (not counting CNEN's "parallel research") amount to about \$5-6 billion per year! That is the minimum that must be invested to prevent a repetition of the rationing in the

Northeast or the blackout in the South. There are simple hydroelectric power plants without the sophisticated complications, uncertainties, and tremendous costs of the dispensable nuclear ones. There are Itaipu and Xingo, Itaparica, and Porto Primavera to provide for the daily consumption of national industries, without which there would be work stoppages and unemployment. It is for this purpose that we need the money from IBRD, not for atomic bombs.

We repeat: What is Mr Rex Nazare seeking? No one knows for sure, although everyone suspects. He is talking to another closed audience, which does not represent the Brazilian people; and for this, he does not hesitate to harm the country.

BANGLADESH

Atomic Energy Commission Chairman Sacked

BK0911075888 *Delhi Domestic Service in English*
0730 GMT 9 Nov 88

[Text] The chairman of the Bangladesh Atomic Energy Commission, Dr Anwar Hussain, has been sacked on charges of negligence of duty.

A government announcement in Dhaka said the services of Dr Hussain have been terminated with immediate effect for being absent in the last day of the annual conference of International Atomic Energy Agency held in Vienna recently. His absence during a voting to condemn Israel for manufacturing nuclear weapons had created misunderstanding among friendly countries.

EGYPT

West Germans Build Small Nuclear Power Stations

51004600 *Paris AL-MUSTAQBAL in Arabic*
15 Oct 88 p 28

[Text] Big West German companies specializing in the production of nuclear power stations have begun producing small nuclear power stations in Egypt ranging in power from 15 to 30 megawatts.

On the basis of information from sources from the West German embassy in Cairo, the stations will generate the needed electrical current for various industrial purposes, home consumption, and lighting. The producing companies find such stations to be appropriate for many uses because of their small size, their high degree of safety, and the possibility of locating them close to the consumption areas. These new stations are within the framework of Egyptian measures to avoid an electric current shortage caused by the increase in local consumption, whether in homes or in industry.

INDIA

Illegal Import of Norwegian Heavy Water Denied

BK0211155688 *Delhi Domestic Service in English*
1530 GMT 2 Nov 88

[Text] India has denied a press report that it has imported heavy water illegally from Norway.

An External Affairs Ministry spokesman told newsmen in New Delhi today that the only heavy water that India imported was from the Soviet Union for the Rajasthan Atomic Power Station under the safeguards of the International Atomic Energy Agency.

He said the rest of our heavy water requirement is met by domestic production.

Nuclear Energy Official on Soviet Reactors

BK0111061388 *Delhi Domestic Service in English*
0240 GMT 1 Nov 88

[Text] The chairman of the Atomic Energy Commission, Dr M.R. Srinivasan, has clarified that the ongoing negotiations with the Soviet Union for procurement of reactors will not affect the country's independent nuclear program. Speaking at a founders day function of the Bhabha Atomic Research Center in Bombay, he said the Russian reactors are similar to the ones being used in Europe and have a proven safety record.

1st Neutron Reactor To Go Critical by December

51500016 *New Delhi PATRIOT in English*
12 Sep 88 p 5

[Text] Madras, Sep 11 (UNI)—India's first neutron reactor getting ready at the Indira Gandhi Centre for Atomic Research at Kalpakkam is expected to go critical this December, marking a new milestone in the country's nuclear programme.

Top atomic scientists told UNI that reactor criticality experiment with uranium 233 aluminum alloy fuel fabricated at the radiometallurgy division of the Bhabha Atomic Research Centre, Bombay, was now in progress.

The inherently safe reactor with a life span of 30 to 35 years has wide applications in non-destructive testing in atomic energy, space and defence.

The totally indigenously designed 30 kw energy reactor christened Kamini is said to be the first of its kind in the world.

The reactor vessel has been put in position at Kalpakkam.

Scientists said safety clearance for commissioning was being obtained from appropriate bodies.

Loading of fuel rods and positioning the beryllium reflectors surrounding the reactor core to prevent escape of neutrons remained to be done.

The reactor would be used for neutron radiography of fuel pins and subassemblies, critical components such as control valves, characterisation of materials and material development.

It could be used for radiation physics studies as well. More specifically the reactor could be used to give information on isotopes, distribution of light elements, to check detonators and explosives and capacitors of naval radars.

Tamil Nadu Fishermen Upset About Proposed Reactor Sites

51500015 Calcutta *THE TELEGRAPH* in English
15 Sep 88 p 5

[Text] Kudankulam (Tamil Nadu), Sep 14 (UNI)—A protest movement is building up in this little hamlet in the southern Tirunelveli district of the state against the possible location of one of the two 1,000 MW-type nuclear reactors being offered to India by the Soviet Union.

Spearheading the agitation is the politically-strong fishermen's community in the three districts of Tirunelveli, Chidambaranar and Kanyakumari, which has voiced concern over the possible radiation fallout once the reactor gets working.

Not far behind are the peasants of the green Kanyakumari district who want to prevent the diversion of water from the Pechiparaiddam, which is now used for irrigating their lands, to the reactor to be used as coolant there.

So articulate are the priests and youth activists leading the fishermen, and the lawyers of Nagercoil leading the farmers, that once the official announcement of locating the reactor at Kudankulam is made, protests are bound to snowball and take concrete shape.

A public meeting at Idinthakarai, a fishing hamlet near Kudankulam, was held on August 28 last to highlight the radiation hazards of nuclear power. The meeting, attended by more than 1,000 people, including fishermen's representatives from the three coastal districts.

It was decided at the meeting to send protest letters "in thousands" to the Prime Minister, Mr Rajiv Gandhi, urging him not to locate the plant at the proposed site and warning of an agitation if an announcement to this effect was made during the Soviet leader, Mr Mikhail Gorbachev's visit in November next.

With a steady stream of anti-nuclear activists flowing into the region from neighbouring state of Kerala and from Madurai, the Christian priests of the region seem to have taken to the view that the reactor must be stalled without compromise. "After all, there have been movements against the siting of nuclear reactors at Kaiga, Kakrapar and the Kothamangalam in Kerala, the last one being successful," they say.

The worries of the fisherfolk are compounded by the fact that a pilot study by the zoology department of the St Xavier's College at Palayamkottai had indicated that rare marine ecological species were available at the Idinthakarai coast, barely 2 km from the reactor site. Fears are being expressed by the fishermen that even if one did not consider radiation, the marine life would suffer irreversible damage if the water temperature rose by even one degree celsius.

The CPI(M) secretary, Mr A. Kumarasamy, who had launched a fast and an agitation for the implementation of many development programmes for the region, says, "We do not know about radiation hazards from the nuclear plant, our party did not tell us about any such thing."

Government Approves 10 Nuclear Power Units

BK2810155888 Delhi *Domestic Service* in English
1530 GMT 28 Oct 88

[Text] The Center has given clearance for the setting up of 10 nuclear power units. Disclosing this to newsmen in Madras, the chairman of the Nuclear Power Cooperation, Mr M.R. Srinivasan, said four 235-megawatt units would be established at Kaiga in Karnataka and four 500-megawatt units at Kota in Rajasthan. Two units will be set up at Tarapur, Maharashtra.

Laser Glass Developed for Nuclear Industry

BK0711094588 Delhi *Domestic Service* in English
0830 GMT 7 Nov 88

[Text] Indian scientists claim to have developed indigenous laser glasses for application in defense and nuclear fields. Researchers at the Central Glass and Ceramics Research Institute—CGCRI—in Calcutta have produced silicate laser glasses for plasma application in nuclear reactors. The laser glasses produced by CGCRI were evaluated by Bhabha Atomic Research Center—BARC—and found to yield 50 percent higher energy output when compared to the imported ones of similar type.

PAKISTAN

Training of Iranians in Atomic Energy Denied

BK1411024588 Islamabad *Domestic Service*
in Urdu 0200 GMT 14 Nov 88

[Text] A Foreign Office spokesman said in Islamabad yesterday that no Iranian was being trained in Pakistan's atomic energy institutions. The spokesman said the report published in a London paper in this connection is totally baseless.

DAWN Urges Expansion of Nuclear Program

BK2310120488 Karachi *DAWN* in English 5 Oct 88 p 7

[Editorial: "Nuclear Power in the Energy Mix"]

[Text] Pakistan's energy sector does not present a very rosy picture. The country's power generation capacity is far below the national need. This has led to frequent loadshedding by WAPDA [Water and Power Development Authority] which is estimated to have caused losses in industrial production to the tune of Rs. [rupees] 50 billion this year. What is worse, the situation is unlikely to change much unless something drastic is done about

it. Power demand has been growing at the rate of 11 per cent per annum and is expected to reach the level of over 25,000 MW at the turn of the century.

At present WAPDA and the KESC [Karachi Electric Supply Corp.] produce about 6,500 MW. But during the dry months, that is from January to May, when the water level in the rivers falls, hydroelectric power output is reduced by 1,900 MW. Conventional sources of energy cannot solve the problem any more. At present 52 per cent of our electricity needs are met by fossil fuels, 46 per cent by hydroelectric power and only two per cent from nuclear sources. This heavy dependence on oil, gas and coal does not speak of a happy situation since fossil fuels have their limits. Although some new oil sources have been tapped and the country is quite rich in coal deposits, their contribution in meeting the growing national energy demand can at best be modest in terms of quantity and quality.

Natural gas needs to be conserved for use in the production of fertiliser and as the basic raw material for the petrochemical industry which has vast scope for development and expansion. The indigenous fossil fuel output being limited, the bulk of the requirements have to be imported at a huge cost. Besides, their use does involve a serious problem of environmental pollution. Hydroelectric power generation can be expanded but its potential is not unlimited. At the most, it can produce 12,000 MW of hydroelectric power economically, and this too, would be subject to seasonal fluctuations, with production dropping sizably during winter months.

That leaves fuller development of nuclear energy as the only practical and feasible proposition for now and for the future. It is cost efficient, it is clean. And there are no limitations on its expansion as a basic source of power. Some advanced industrialised countries have established beyond doubt that nuclear energy can be developed sufficiently and at a reasonable cost to meet the growing electricity requirements. France, for instance, obtains 65 per cent of its total energy needs from nuclear reactors, Belgium gets 51 per cent and Finland 42 per cent.

If Pakistan has failed to make headway in its nuclear energy sector, the reasons are mainly political. Although the Government had drawn up a programme for setting up a chain of nuclear reactors for generation of energy, this did not materialise on account of the unwillingness, mainly under pressure, of outside powers to supply nuclear equipment to Pakistan. France reneged on the contract for the supply of a reprocessing plant a decade ago. Later, it also failed to honour an understanding for the delivery of a 900-MW nuclear plant for Chashma.

The United States, which has been implacably opposed to Pakistan's nuclear programme, has influenced other suppliers not to sell reactors or other nuclear equipment

to Pakistan. The stand adopted by them vis-a-vis this country's peaceful atomic energy programme has been characterised by duplicity and lack of good faith. While professing their concern for nuclear non-proliferation, they have demanded that Pakistan sign the Nuclear Non-Proliferation Treaty [NPT] and subject its nuclear installations to full-scope safeguards and inspection which are far more stringent than those prescribed by the IAEA. For its part, Islamabad has denied using its nuclear facilities for military purposes, as alleged in some Western quarters, and has offered to sign the NPT if India does the same.

While denying Pakistan access to the necessary equipment, the nuclear suppliers have felt no compunction about making reactors, fuel and heavy water available to India whose nuclear record is not as unblemished as New Delhi claims or its Western apologists would have us believe. No such myth can be sustained in the face of the so-called 1974 'peaceful' test explosion of a nuclear device in the Rajasthan desert, the acquisition of a nuclear-powered submarine, the deal with the US for the supply of super-computers which have a potential in the development of nuclear weapons, and many such developments. These do not seem to prick the nuclear conscience of some of the leading Western protagonists of nuclear non-proliferation.

The latest example of the nuclear powers' partisanship towards India is the agreement the Soviet Union is expected to sign for the supply to that country of two nuclear reactors on soft terms.

Considering Pakistan's urgent need for developing nuclear technology for power generation, it is important that the nuclear suppliers modify their approach. If for argument's sake we accept their concern for nuclear non-proliferation as genuine—though they have not displayed the same concern where Israel and South Africa are involved—it would be logical to ask them to prove their bona fides by working for the creation of a nuclear non-proliferation regime in South Asia rather than deny Pakistan the means for developing nuclear energy for peaceful purposes. This means their efforts should be directed towards India to get it to sign the NPT and agree to the establishment of a nuclear-weapon-free-zone in the region.

Pakistan's bona fides in the matter should not be doubted. Its need for nuclear power as a source of energy is self-evident and is privately acknowledged by even those who, for political and diplomatic reasons, choose to adopt a different stance. Pakistan's own option, where its pressing development needs are at stake, is quite obvious. But the nations which deny Pakistan access to nuclear technology for reasons of political expediency or under pressure should reconsider their stand in the light of the dictates of justice and fairness.